

REMARKS/ARGUMENTS

I. Introduction

Claim 60 has been amended, and claim 48 has been canceled. Claims 79 and 80 are new. Claims 47, 49, 53-55, 60-63, 67, and 70-80. Applicants respectfully request reconsideration of the application.

Applicants note that the amendment to claim 60 is supported at least by Figures 2A and 2C and page 10, lines 6-17 of the specification as originally filed. New claims 79 and 80 are supported at least by Figures 2A and 2C and page 12, line 15 to page 13, line 2 of the specification as originally filed.

Applicants also note that the Declaration of Geatan L. Mathieu (hereinafter the "Mathieu Declaration") is filed with and in support of this Paper.

II. Rejection Under 35 USC § 112, Second Paragraph

Claims 47-49, 53-55, 60-63, 67, and 70-78 were rejected under 35 USC 112, second paragraph. Applicants respectfully traverse this rejection.

Initially, Applicants note that the second paragraph of 35 USC 112 requires that "the claims set out and circumscribe a particular subject matter" only "*with a reasonable degree of clarity and particularity.*" (MPEP § 2703.02 (emphasis added).) The MPEP states that the "examiner's focus during examination of claims for compliance with the requirement for definiteness of 35 U.S.C. 112, second paragraph, is whether the claim meets the threshold requirements of clarity and precision, not whether more suitable language or modes of expression are available." (MPEP § 2703.02.) Moreover, "[s]ome latitude in the manner of expression and the aptness of terms should be permitted even though the claim language is not as precise as the examiner might desire."

Contrary to the PTO's assertion that the distinguishing structure of the claimed tested die is not clear, the claims themselves recite a structural feature of the claimed tested die. That is, as recited in claim 60, "at least one of the die or the contactor device" is moved "such that terminals of the die are pressed against blades of interconnection elements of the contactor device," which "causes the blades to wipe across the terminals," which results in "the cutting edge of each blade slicing into a surface of each of the terminals so that a slice mark is created on each of the

terminals." (See also the Mathieu Declaration, ¶¶ 3-5.) These slice marks are a structural feature of the claimed die that results from the recited process. The scope of claim 60, for example, is thus reasonably clear: the tested die of claim 60 includes slice marks on its terminals produced as blades of the interconnection elements wipe across the terminals during testing of the die. Because each of the other claims pending in the application depends from claim 60, each claim now pending in the application includes the foregoing structural feature.

The PTO's statement that such slice marks are akin to an identifier printed on the terminals is simply wrong and does not seem to belong in a rejection based on 35 USC 112, second paragraph. Nevertheless, as Applicants have previously noted, the scrub marks left on terminals of a die can affect the usefulness and functionality of the terminals and the dies. (See, e.g., U.S. Patent No. 5,506,499 to Paur (cited in the IDS filed June 21, 2005), col. 2, lines 21-40 and col. 3, lines 7-25.)

The PTO also repeated its assertion that the meanings of the terms "cutting edge" and "slice mark" are not clear. The PTO has not, however, explained why these terms are unclear. In fact, these terms are common terms with definitions in most if not all dictionaries. What is unclear is thus not the terms but why the PTO believes that these terms are unclear. Unless the PTO articulates why common terms that appear in most if not all dictionaries are unclear, the PTO should withdraw the rejection.

For at least the foregoing reasons, Applicants respectfully assert that all pending claims meet the requirements of 35 USC 112, second paragraph. Therefore, the rejections should be withdrawn.

III. Rejection Under 35 USC § 112, First Paragraph

A. Written Description

Claims 47-49, 53-55, 60-63, 67, and 70-78 were rejected as allegedly failing to comply with the written description requirement. The PTO has repeated its objection to the claim features of "cutting edge" and "slice mark" as being new matter because they allegedly do not appear in the original disclosure. The PTO also newly asserted that there is no original disclosure that blades are pressed against pads, and the meaning of "pressed" is unclear.

As Applicants have previously noted, there is no requirement that the terminology used in the claims appear *exactly* in the original disclosure. "Newly added claim limitations must be

supported in the specification through express, *implicit, or inherent* disclosure." (MPEP 2163(I)(B) (emphasis added); see also MPEP 2163(III)(A) (describing the Examiner's burden when making a rejection for lack of written description support).)

The claimed feature of a "cutting edge" is supported by examples within the originally filed specification in numerous places (see, e.g., page 5, lines 3-6; page 9, lines 16-21; page 10, lines 18-23; page 11, lines 12-15; page 20, lines 9-11; and page 29, lines 16-17). As a particular example, and not by way of limitation, Figures 2A-2C illustrate an embodiment in which a blade 22 is oriented so that it can "slice (cut) through any non-conductive layer(s) on the surface of the terminal" (page 10, lines 21-23). From at least this example, a person skilled in the art would readily recognize that the original disclosure provides a description of a "blade comprising a cutting edge along a length of the blade" as presently claimed.

The claimed feature of a "slice mark" is also supported by examples within the originally filed specification in numerous places (see, e.g., page 5, lines 7-11; page 9, line 23 – page 10, line 3; and page 31, lines 11-14). As a particular example, and not by way of limitation, the originally filed specification describes how the cutting edge of the blade cleanly cuts through the non-conductive layer on the terminal enabling a good electrical connection. This is in contrast to prior art probes that scrape across the terminal surface "much as a bulldozer scrapes aside a layer of dirt" damaging the surface of the terminal (page 11, line 8 – page 12, line 7). As is known in the art, this damage created by prior art probes is called a "scrub mark." The interconnection elements described within the originally filed specification, in contrast, produce slice marks, as a slicing (as opposed to scrubbing) action is performed. A person of ordinary skill in the art would therefore readily recognize that the original disclosure provides a description of a slice mark made on a terminal by the cutting edge of a blade slicing into a surface of the terminal as presently claimed.

In asserting that the meaning of "pressed" is unclear, the PTO again fails to explain what is unclear about the word "pressed." Applicants assert that the term "press" is a reasonably clear term. One accepted definition of the term "press" is as follows: "to move by . . . force in a certain direction . . ." (See the online dictionary www.dictionary.com.) There is therefore nothing unclear about the word "press." Moreover, the drawings illustrate an example in Figures 2A and 2C in which a terminal 44 of an electronic device 42 (which can be an example of a die) is moved by a force F in the direction of a blade 22, which causes the blade 22 to wipe across the

terminal 44. (See the amended version of Figures 2A and 2C as those figures were amended in a Paper dated June 6, 2006.) There is thus nothing unclear about the meaning of the word "pressed," and the specification does indeed disclose a non-limiting example.

In light of the above, the claims are adequately supported by the original written description, and Applicants request that the PTO withdraw the rejection for allegedly not complying with the written description requirement.

B. Enablement Requirement

Claims 47-49, 53-55, 60-63, 67, and 70-78 were rejected as allegedly failing to comply with the enablement requirement. Applicants respectfully traverse this rejection.

The enable requirement of the first paragraph of 35 USC 112 requires nothing more than that the patent specification disclose sufficient information for a person of ordinary skill in the field to be able to make and use the invention as claimed without undue experimentation. Among other places, the specification provides a non-limiting example of how to make an example of the blades recited in the pending claims in at least Figures 5A to 5E, and the specification provides a non-limiting example of how to use the blades in at least Figures 2A and 2C. As shown in Figure 2C, for example, a force applied to blade 22 by contact with a terminal 44 causes spring contact element 24 to deflect, which results in blade 22 wiping across the terminal 44. As explained, for example, on page 10, lines 5-23, this causes the blade 22 to slice or cut into the terminal 44. (See the specification and the drawings as amended June 6, 2006.) Applicants respectfully assert that at least the foregoing portions of the drawings and specification provide sufficient information for a person of ordinary skill in the field to make and use the invention as claimed. The specification and drawings thus fully meet the enablement requirement of the first paragraph of 35 USC 112. For this reason alone, the rejection should be withdrawn.

The PTO seems to rely solely on the assertion that, because aluminum oxide is allegedly a ceramic material with a crystalline structure, it cannot be cut or sliced but can only be broken.

Initially, Applicants assert that, even if the PTO's assertion that aluminum oxide is a ceramic material with a crystalline structure that cannot be cut or sliced is accurate, that assertion alone does not establish that the claims are not enabled. As discussed above, the specification

and drawings provide sufficient information for a person of ordinary skill in the field to make and use the invention as claimed. The enablement requirement is therefore fully met.

Moreover, Applicants assert that the PTO's assertion is wrong. As set forth in the Mathieu Declaration, the native aluminum oxide that forms on an aluminum bond pad such as are sometimes used on some types of semiconductor dies is extremely thin (e.g., 10-30 angstroms). (Mathieu Declaration ¶ 10.) Such a thin layer of aluminum oxide is simply too thin to exhibit properties of bulk ceramic material such as brittleness, etc. The PTO's assertion that aluminum oxide on an aluminum terminal cannot be cut but can only be broken because it has the properties of a ceramic is thus simply wrong. At least for this additional reason, the rejection should be withdrawn.

As requested by the Examiner, Applicants provide a picture of a slice mark made on a terminal of a die by a blade wiping across the terminal. (See the Mathieu Declaration, ¶¶ 4 and 5 and Exs. B and C.) Applicants note that the pictures in Ex. A, B, and C of the Mathieu Declaration are examples only and do not limit the claims.

IV. Objection To The Drawings:

The drawings were objected to on the grounds that the drawings allegedly do not show the semiconductor product that is the subject matter of the claims. Applicants note that Figure 2C as amended in the Paper filed June 6, 2006, illustrates an electronic device 42, which is a non-limiting example of a semiconductor die. The drawings thus do in fact include a semiconductor product—the electronic device 42 of Figure 2C—that can be an example of the die of claim 60 and the other claims pending in the application. The objection to the drawings should therefore be withdrawn.

V. Rejection In View Of Prior Art:

Claims 47-49, 60-63, 67, 70, 72-75, and 78 were rejected under 35 USC 102(e) as allegedly anticipated by US Patent No. 5,883,519 to Kennedy (hereinafter "Kennedy"). In addition, claims 48, 53-55, 71, 76, and 77 were rejected under 35 USC 103(a) as obvious in view of Kennedy. Applicants respectfully traverse these rejections. As discussed below, Applicants assert that the slice mark on the die of independent 60 is structurally different than the mark

made by Kennedy's invention on Kennedy's chip 13, and at least this structural difference renders claim 60 patentable over Kennedy.

As disclosed in Kennedy and discussed in the Mathieu Declaration, Kennedy raises a probe tip 30 above a terminal of a chip 13 and then slams the probe tip 30 like a hammer onto the surface of the terminal. (See Figures 3 and 6 of Kennedy.) The Kennedy patent requires that the tip 30 have "substantial velocity and therefore a high kinetic energy" as the tip 30 impacts the terminal. (The Kennedy patent col. 5, lines 11 and 12; see also col. 6, lines 30-37.) Although the tip 30 may move in a partial arc as it is first raised away from the terminal and then moved into contact with the terminal, the tip 30 is moving substantially perpendicular to the terminal of the chip 13 when the tip 30 impacts the terminal. The relatively high kinetic energy of the tip 40 and the substantially perpendicular motion of the tip 30 into the terminal of the chip 13 will puncture the terminal, creating a puncture mark (i.e., a hole) that extends substantially perpendicularly into the terminal. (See the Mathieu Declaration ¶¶ 6 and 7.)

In contrast, the blades of claim 60 gently wipe generally horizontally across a terminal of the semiconductor die of claim 60, creating a slice mark into the terminal. (See the Mathieu Declaration ¶¶ 3-5.) Moreover, as set forth in the Mathieu Declaration, the slice marks have a distinctive heel portion and elongated portion examples of which are illustrated in Exs. B and C of the Mathieu Declaration. (See the Mathieu Declaration ¶¶ 4 and 5 and Exs. B and C.) Puncture marks—essentially holes—in terminals of a semiconductor die made by Kennedy's invention are nothing like the distinctive slice marks made on terminals of the die of claim 60 by the process recited in claim 60. (See the Mathieu Declaration ¶¶ 6-8.) At least for this reason, the slice marks on the semiconductor die of claim 60 by the process recited in claim 60 are novel with respect to Kennedy.

Moreover, it would not be obvious to modify Kennedy in any way that would result in Kennedy's invention making the type of slice marks shown in Exs. B and C of the Mathieu Declaration on terminals of a semiconductor die. For a person of ordinary skill to replace the puncture marks on Kennedy's dies with slice marks as shown in Exs. B and C of the Mathieu Declaration, the person of ordinary skill would have to replace Kennedy's process of hammering probe tips into the terminals with a process that wipes blades across the terminals. There is, however, no reason for a person of ordinary skill to replace Kennedy's method of hammering probe tips into semiconductor terminals with a process of wiping blades across the terminals.

For at least this reason, claim 60 is not obvious in view of Kennedy. Indeed, only unpermitted hindsight use of Applicants' specification could lead to replacing Kennedy's hammering method with the wiping method of claim 60.

In short, claim 60 is patentable over Kennedy at least because the puncture marks created by the more violent hammering action of Kennedy are different structurally than the slice marks created as blades of claim 60 gently wipes across terminals of the die. In short, Kennedy's chip 13 will have violently created puncture marks (i.e., holes) on its terminals while the chip of claim 60 has gently created slice marks of the type illustrates in Exs. B and C of the Mathieu Declaration.

For at least these reasons, claim 60 is patentable over Kennedy. In addition, the other claims pending in this application depend from claim 60 and, at least because of that dependency are also patentable over Kennedy.

VI. Probes Commonly In Use At The Priority Date Of This Application:

As set forth in the Mathieu Declaration, probes for testing semiconductor dies commonly in use at the priority date of this application do not create slice marks on terminals of semiconductor dies. Buckling beam probes are an example of a type of probe in use at the priority date of this Application.

Buckling beam probes create puncture marks (i.e., holes) in semiconductor die terminals. (Mathieu Declaration ¶ 9.) US Patent No. 3,806,801 (the '801 patent) illustrates an example of buckling beam probes. (See probes 15 in Figure 1 of the '801 patent; see also col. 1, lines 45-54.) The Taber Paper (Taber et al., "Vertical Probing Experiences," International SEMATECH Wafer Probe Council, 2003 Southwest Test Workshop) also illustrates on page 8 a basic diagram of buckling beam probes. (The Taber Paper is citation no. 2 in the IDS filed June 1, 2009 with this Paper.) As shown in the '801 patent and on page 8 of the Taber Paper, buckling beam probes are long and thin. When ends of buckling beam probes are pressed against terminals of a semiconductor die, the long beams buckle as illustrated on page 8 of the Taber Paper. (See also Mathieu Declaration ¶ 9.) The ends of the buckling beams probes make puncture marks—or holes—in the terminals of the die. (See Mathieu Declaration ¶ 9.) As discussed above with respect to the Kennedy patent, the slice marks on the die of claim 60 are patentably distinct from simple puncture marks. Thus, for at least reasons similar to some of the reasons discussed above

with respect to the Kennedy patent, the die of the claims of this application is patentable over dies tested using buckling beam probes.

In fact, neither buckling beam probes nor any other type of probe or process of using a probe of which Applicants are aware that was in use at the priority date of this application makes slice marks like the slice marks shown in Exs. B and C of the Mathieu Declaration. (See Mathieu Declaration ¶ 9.) Nor would there be a reason to modify any prior art probe or process of using such a probe in any way that such a probe or process would make slice marks like the slice marks illustrated in Exs. B and C.

Applicants submit herewith the Mann Paper (Mann, "'Leading Edge' Of Wafer Level Testing," 2004 Southwest Test Work Shop (2004) 64 pages), which is cited as citation no. 3 in the IDS filed June 1, 2009. The Mann Paper illustrates several different types of probes. (See the Mann Paper pp. 13-17.) Applicants note that the Mann Paper is dated 2004, and some of the probes shown in the Mann paper therefore may not have been available or in use prior to the priority date of this application. Applicants thus do not assert or concede that all of the probes disclosed in the Mann Paper are prior art to this application. Nevertheless, Applicants submit the Mann Paper because the Mann Paper shows examples of marks made on semiconductor terminals by those probes (see the Mann Paper pp. 32, 35, 37, 38, and 42). As can be seen, none of those marks is like the slice mark illustrated in Exs. B and C of Mathieu Declaration. Applicants note that a probe with a blade that can be a non-limiting example of the blade recited in claim 60 is illustrated on page 39, and a non-limiting example of a slice mark made by the blade is shown in page 41.

VII. Conclusion

In view of the foregoing, Applicants submit that all of the claims are allowable and the application is in condition for allowance. If at any time the Examiner believes that a discussion

with Applicants' attorney would be helpful, the Examiner is invited to contact the undersigned or Ken Burraston at (801) 426-2100.

Respectfully submitted,

Date: June 1, 2009

By /N. Kenneth Burraston/
N. Kenneth Burraston
Reg. No. 39,923

Kirton & McConkie
P.O. Box 45120
Salt Lake City, Utah 84145-0120
Telephone: (801) 426-2106
Fax: (801) 321-4893